

A new locally endemic species of *Acrotriche* (Ericaceae: Styphelioideae: Stypheliaceae) from the Ravensthorpe area

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Abstract

Hislop, M. A new locally endemic species of *Acrotriche* (Ericaceae: Styphelioideae: Stypheliaceae) from the Ravensthorpe area. *Nuytsia* 20: 19–25 (2010). A new and apparently rare species of *Acrotriche* R.Br., *A. orbicularis* Hislop, is described, illustrated and its distribution mapped. For purposes of comparison, the species with which it is most likely to be confused, *Acrotriche cordata* (Labill.) R.Br., is also illustrated and mapped. An updated key to the *Acrotriche* species of Western Australia is provided.

Introduction

The Ravensthorpe Range extends approximately 50 km on a northwest-southeast axis to the north and east of the small, south-coast town of Ravensthorpe. It has long been known for its complex geology, and in recent decades it has become increasingly clear through a series of biological surveys (Chapman & Newbey 1995; Kern *et al.* 2008), that it is also an area of high biodiversity. In their analysis of phytogeographic patterns within the Southwestern Australian Floristic Region, Hopper & Gioia (2004) identified the area as one of exceptional species richness, with a correspondingly high level of endemism. Craig (Harris *et al.* 2008) lists over 50 endemics or near endemics for the range. This number is growing steadily as ongoing taxonomic research, based on an expanding specimen base, continues to identify new and often geographically restricted taxa. Of these endemics, six (including the species described below) are restricted to the relatively isolated Bandalup Hill and immediate vicinity.

Significant deposits of several economically important minerals are present in the Ravensthorpe Range, and the area has a long history of mining, dating back to the last years of the nineteenth century. Within the last decade a major new nickel mine commenced operation at Bandalup Hill. Although that project is currently in abeyance, the continued high demand for other minerals, such as gold and copper, is likely to give rise to new mining proposals for the area. Much of the recent flora survey work has been undertaken either directly for mining companies, or by the Department of Environment and Conservation (DEC), as it seeks to more fully assess the conservation values of the range in anticipation of future mining applications.

During survey work associated with one such study (Kern *et al.* 2008), a problematic collection of a species of *Acrotriche* R.Br. was made at Bandalup Hill and later referred to the author. The specimen was similar in leaf shape to a broad-leaved variant of the widespread and variable *Acrotriche cordata*, but with an anomalous, pruinose texture. However the material was in early bud and its true status could not be ascertained before the completion of that project. In their report therefore, the authors referred to the plant informally as *Acrotriche* aff. *cordata* (S. Kern & R. Jasper LCH 16953) and highlighted it as being of potential taxonomic interest under the heading 'Taxa requiring further study'. The species was finally collected in flower by DEC botanists, R. Butcher and A. Markey, as part of a concerted effort to resolve the status of some of the more problematic taxonomic entities from the range. Examination of the new material, along with Kern & Jasper's earlier *Acrotriche* collections from Bandalup Hill, revealed that there were significant differences in floral morphology between *Acrotriche* aff. *cordata* and typical *A. cordata*. It also confirmed the view, expressed by the authors in Kern *et al.* (2008), that the new taxon grows with *A. cordata* at this locality. The phrase-name *Acrotriche* sp. Ravensthorpe (S. Kern *et al.* LCH 16953) was subsequently entered on the Census of Western Australian Plants to allow an assessment of its conservation status. The primary purpose of this paper is to formally describe the new species and to update the most recent key (Hislop 2007) to the Western Australian members of the genus.

Methods

This study was based on an examination of dried specimens housed at PERTH. The details of the methods used to measure plant parts and make other morphological observations are the same as those described in an earlier paper on the genus *Acrotriche* (Hislop 2007).

The distribution map was compiled using DIVA-GIS Version 5.2.0.2 and based on PERTH specimen data.

Key to the Western Australian species of *Acrotriche* (modified from Hislop 2007)

1. Corolla white, hairs evenly distributed across the lobes and into the throat of the tube (Borden–Wellstead–Ongerup areas).....**A. dura**
- 1: Corolla predominantly greenish, occasionally yellowish-green or greenish suffused purple, lobes usually with hairs confined to subapical tufts, occasionally with very sparse, long hairs scattered across the surface, the tube with 5 hair tufts in the throat
2. Leaf apex sharply mucronate
3. Leaves with recurved margins; sepals *c.* 2 mm long; corolla lobes at least 2 mm long (Stirling Range to the Ravensthorpe area and between Cape le Grand and Israelite Bay) ..**A. ramiflora**
- 3: Leaves slightly concave, flat or slightly convex; sepals to 1.7 mm long; corolla lobes to 1.3 mm long
4. Leaves ovate, occasionally narrowly ovate, 3–6 mm wide, most or at least some with cordate bases, veins 5–7(–9+), ± equally distinct, midrib to 0.1 mm wide; corolla throat hairs issuing directly from unmodified epidermal cells; endocarp with prominent longitudinal ribs (coastal and subcoastal areas of the SE between Toolinna Cove and the South Australian border)..... **A. patula**
- 4: Leaves narrowly ovate, 1.7–3.2 mm wide, base rounded but never cordate, veins 3–5 (usually 3) with the midrib prominent and usually produced into a distal abaxial keel, midrib 0.2–0.3 mm wide; corolla throat hairs issuing from

- 5 raised cushion-like outgrowths; endocarp smooth (the central south-west, between the Kondinin area in the west and the Bremer Range in the east, and between Great Eastern Highway in the north and the Lake King area)..... **A. lancifolia**
- 2: Leaf apex usually obtuse or subacute, very occasionally acute, but then with an innocuous tip, never sharply mucronate
5. Corolla lobe hairs largely confined to a subapical tuft, the latter arranged in a crescent-shaped formation; ovary 7–10-locular (Stirling Range to the Ravensthorpe area with an outlier W of Lake Grace)..... **A. parviflora**
- 5: Corolla lobe hairs either mostly in a subapical tuft or not, but if so then the tuft \pm straight transverse band; ovary 4–5-locular
6. Leaves pruinose, broadly ovate to depressed-ovate, broadly elliptic to transversely elliptic or occasionally broadly obovate to depressed-obovate; corolla lobes 0.6–0.7 mm long, with rather sparse hairs scattered across the surfaces; corolla throat hairs issuing from unmodified epidermal cells (Ravensthorpe area) **A. orbicularis**
- 6: Leaves not pruinose, variable in shape, whether ovate, elliptic or obovate, rarely broadly so; corolla lobes 1.2–1.9 mm long, with hairs in a well-defined subapical tuft (occasionally a very few hairs may be present below the tuft); corolla throat hairs dense, issuing from 5 raised, cushion-like outgrowths (frequently coastal but sometimes extending well inland in areas adjacent to the south coast, from the central west coast near Lecman southwards along the west and south coasts to the Great Australian Bight)..... **A. cordata**

Taxonomy

Acrotriche orbicularis Hislop, *sp. nov.*

A. cordatae affinis sed foliis pruinosis, et lobis corollae sparse et irregulariter pilosis, non pilis in serialibus-transversalibus manifestis differt.

Typus: East of Ravensthorpe [precise locality withheld for conservation reasons], Western Australia, 18 September 2008, R. Butcher & A. Markey RB 1306 (*holo*: PERTH 08023352; *iso*: CANB, NSW).

Acrotriche sp. Ravensthorpe (S. Kern et al. LCH 16953), Western Australian Herbarium, in *FloraBase*, <http://florabase.dec.wa.gov.au> [accessed October 2009].

Compact, spreading *shrubs* to c. 60 cm high and 80 cm wide. Young *branchlets* with a moderately dense indumentum of straight or \pm curved, patent to distinctly retrorse hairs, 0.08–0.10 mm long, persistent in patches on the older wood for several seasons. *Leaves* spirally arranged, usually shallowly to steeply antrorse, occasionally \pm patent, either broadly ovate to depressed-ovate, broadly elliptic to transversely elliptic or occasionally broadly obovate to depressed-obovate, 4.8–8.2 mm long, 3.8–8.0 mm wide; apex a poorly-defined callus, obtuse; base usually truncate or rounded, less often cuneate or cordate; petiole well-defined, pale yellowish-green or yellow-brown, 0.8–1.3 mm long, with a moderately dense indumentum of retrorse hairs on the adaxial surface; lamina 0.35–0.50 mm thick, \pm straight or gently recurved along the longitudinal axis, usually adaxially convex, less often \pm flat; surfaces glabrous, pruinose, \pm concolorous on young leaves, but usually becoming discoloured through abrasion on old growth, adaxial surface initially matt, becoming shiny on older growth,

venation not evident, abaxial surface paler following abrasion, with 7–9 moderately conspicuous, flat, primary veins, the midrib not differentiated from the others; margins glabrous. *Inflorescence* axillary or issuing from bare nodes below the leaves, erect to spreading; axis 2–4 mm long, with 3–7 flowers terminating in an obscure, bud-like rudiment; axis indumentum of dense, variably orientated hairs 0.2–0.3 mm long; flowers erect and sessile. *Fertile bracts* depressed-ovate to \pm orbicular, 0.9–1.1 mm long, 1.0–1.1 mm wide, obtuse; abaxial surface with obscure venation, glabrous apart from a zone of short hairs close to the apex; adaxial surface glabrous; margins ciliolate. *Bracteoles* broadly ovate, 0.9–1.2 mm long, 0.7–0.8 mm wide, obtuse, obscurely keeled; abaxial surface hairy about the keel, sometimes sparsely hairy elsewhere, cream- or straw-coloured; adaxial surface glabrous; margins ciliolate. *Sepals* ovate, 1.3–1.5 mm long, 0.9–1.1 mm wide, obtuse; abaxial surface glabrous or with a few hairs towards the apex, cream or greenish-cream becoming scarious towards the margins, the venation obscure; adaxial surface glabrous; margins ciliolate with hairs 0.08–0.12 mm long. *Corolla tube* green, cylindrical, much longer than the sepals (by up to 1.6 mm), 1.9–2.5 mm long, 0.9–1.0 mm wide, the outer surface glabrous, the inner with 5 rather sparse tufts of hair below the lobes, these issuing from unmodified epidermal cells, glabrous below. *Corolla lobes* green, much shorter than the tube (ratio = 0.3–0.4: 1), widely spreading, 0.6–0.9 mm long, 0.5–0.6 mm wide at base, glabrous externally, the inner surface sparsely and irregularly hairy (the hairs to 0.5 mm long) and faintly papillose. *Anthers* partially exerted from the tube at anthesis, 0.4–0.5 mm long; *filaments* terete, 0.2–0.3 mm

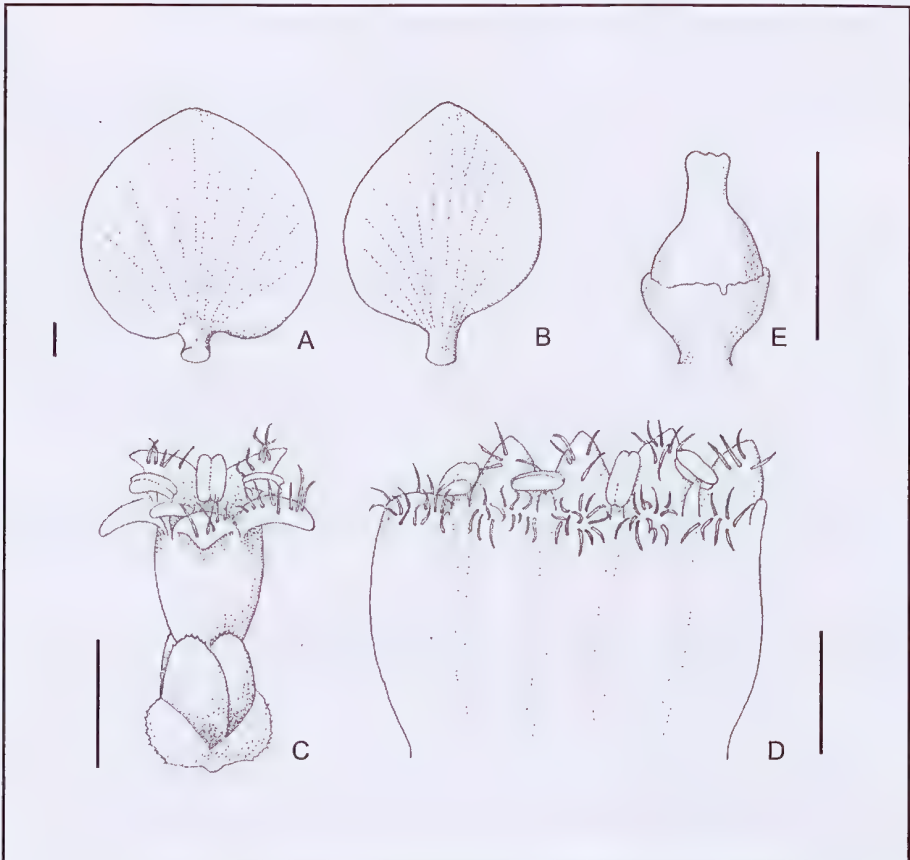


Figure 1. *Acrotriche orbicularis*. A–B – examples of variation in leaf shape (abaxial surfaces); C – flower; D – corolla slit open longitudinally; E – gynoecium. All scale bars = 1 mm. Drawn by Skye Coffey from R. Bucher & A. Markey 1306.

long, attached close to anther apex, adnate to tube just below the sinus. *Ovary* ellipsoid to obovoid, 0.8–1.0 mm long, 0.5–0.6 mm wide, glabrous, 5-locular; *style* 0.5–0.6 mm long, tapering smoothly from ovary apex, included within corolla tube; *stigma* not expanded; *nectary* annular 0.45–0.55 mm long, glabrous, irregularly and shallowly lobed. *Fruit* not seen. (Figure 1)

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 18 Sep. 2008, R. Butcher & A. Markey RB 1307 (PERTH); 24 May 2007, S. Kern, R. Jasper & D. Brassington LCH 16953 (PERTH); 18 Sep. 2008, A. Markey & R. Butcher 6243 (PERTH).

Distribution and habitat. *Acrotriche orbicularis* is known only from Bandalup Hill, east of Ravensthorpe, (Figure 2), where it occurs as a component of the understorey of low Eucalypt woodland, in loam soils over magnesite.

Phenology. The only flowering specimens seen were collected in September. This material was in late flower suggesting that July and August are likely to be the months of peak flowering.

Etymology. From the Latin *orbiculus* (rounded, flat with a circular outline), a reference to the leaf shape, which although rather variable on individual plants, is frequently orbicular or suborbicular.

Conservation status. Under the phrase-name *Acrotriche* sp. Ravensthorpe (S. Kern *et al.* LCH 16953) this species has been assigned Priority One status (DEC Conservation Codes for Western Australian Flora). There is an unvouchered record of the species from a location five to six kilometres north of Bandalup Hill which requires confirmation.

Affinities. In terms of its gross morphology the new species is most similar to *Acrotriche cordata* (Figure 3). The latter is widespread in near-coastal parts of Western Australia between the central west coast and the Great Australian Bight (Figure 2), and also occurs in South Australia and western Victoria. It is an exceptionally variable species in terms of its leaf shape, and within Western Australia at least, there appears to be some geographical pattern to this variability. Potential co-relating floral or fruiting differences however are not apparent.

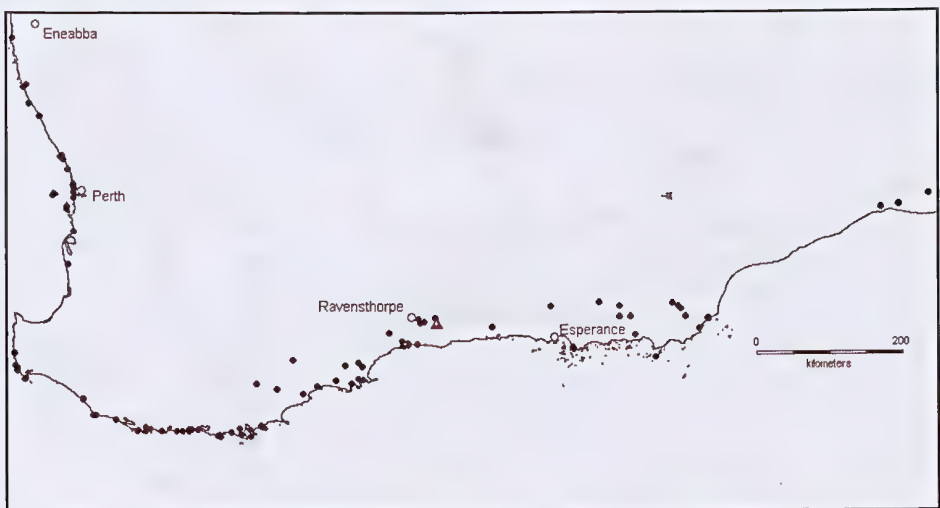


Figure 2. Distribution of *Acrotriche orbicularis* (▲) and *A. cordata* (●) in Western Australia.

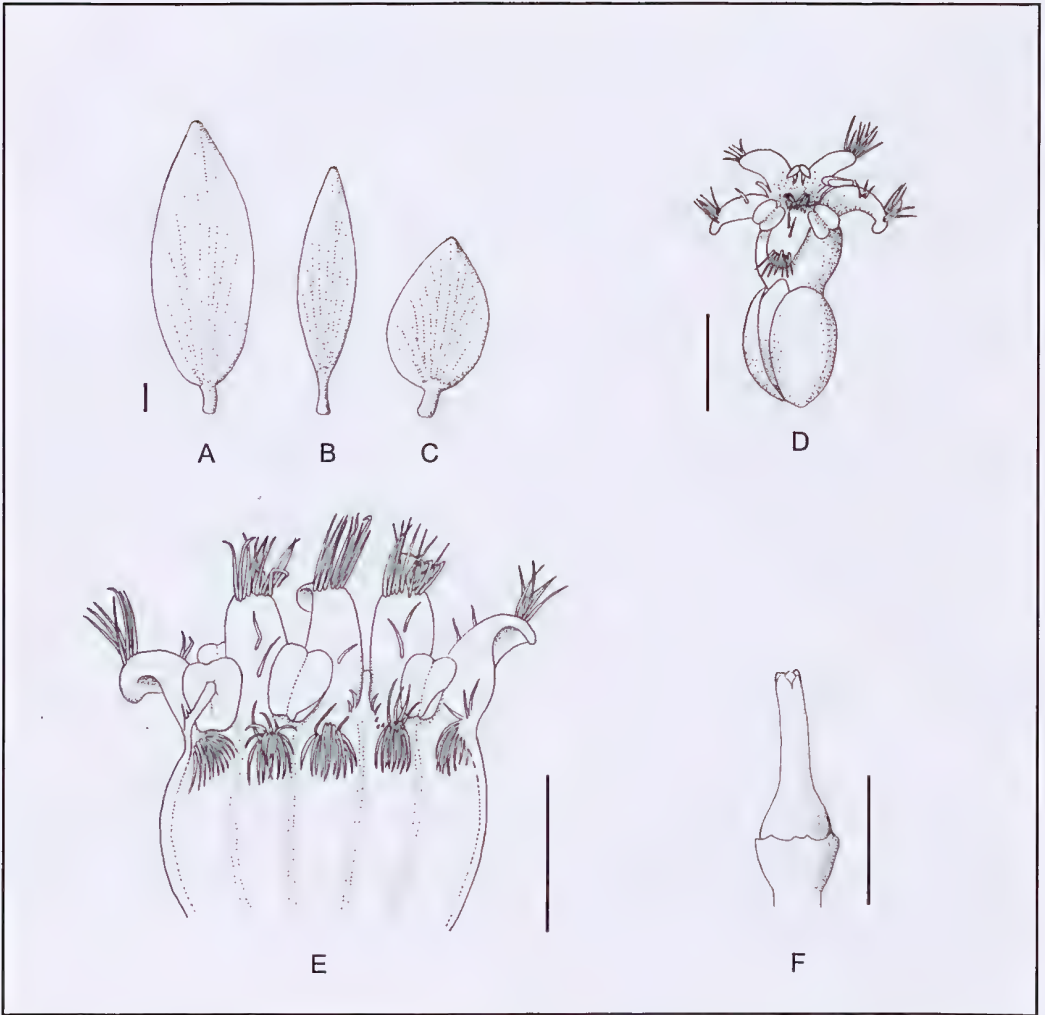


Figure 3. *Acrotriche cordata*. A–C – examples of variation in leaf shape (abaxial surfaces); D – flower; E – corolla slit open longitudinally; F – gynoceium. All scale bars = 1 mm. Drawn by Skye Coffey from S. Kern, R. Jasper & D. Brassington LCH 17212 (A); R. Spjut, G. White, R. Phillips & L. Lacy 7342 (B); S. Kern, R. Jasper & D. Brassington LCH 17067 (C); E.A. Brown 97/321, P.G. Wilson & N. Lam (E–F).

Acrotriche cordata is sympatric with *A. orbicularis* at the type locality of the latter. However the variant of *A. cordata* that occurs in the Ravensthorpe Range and surrounding district invariably has narrower leaves (Figure 3A–C shows leaf variation in the Ravensthorpe–Hopetoun area), and always lacks the pruinose texture of *A. orbicularis*. These foliar differences suggest that the two should be readily separable in the field. There are also several significant floral differences between the species. *Acrotriche orbicularis* can always be separated from *A. cordata* by its shorter corolla lobes (0.6–0.9 mm long compared to 1.2–1.9 mm for *A. cordata*), which are very sparsely and irregularly hairy (rather than having hairs concentrated in dense, transverse, subapical tufts), a shorter style (0.5–0.6 cf. 0.9–1.5), and relatively sparse hair tufts issuing from unmodified epidermal cells in the corolla throat (cf. dense hairs from cushion-like outgrowths).

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References

- Chapman, A. & Newbey, K.R. (1995). A vertebrate fauna survey and some notes on the vegetation of the Ravensthorpe Range, Western Australia. *CALMScience* 1: 465–508.
- Harris, R. J., Majer, J.D., Williams, C., Buckley A. & Stehlik D. (2008). *Ravensthorpe Range and Overshot Hill - an overview of biodiversity values, threats and conservation*. Sustaining Gondwana Working Paper Series, issue 12.
- Hislop, M. (2007). A new species and a new combination in *Acrotriche* (Ericaceae: Styphelioideae: Stypheliceae), with keys to the Western Australian members of the genus and its closest relative *Lissanthe*. *Nuytsia* 16: 285–297.
- Hopper, S.D. & Gioia, P. (2004). The southwest Australian floristic region: evolution and conservation of a global hot spot of biodiversity. *Annual Review of Ecology, Evolution and Systematics* 35: 623–650.
- Kern, S., Jasper, R., & Truc D. (2008). *Floristic survey of the Ravensthorpe Range 2007*. Unpublished report for Department of Environment and Conservation (Western Botanical: Bassendean, WA.).